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ABSTRACT

This game is designed to provide basic energy information and to foster addition, subtraction, and multiplication skills while the game is being played. Game cards contain questions, answers, and information on the value of the questions. The cards are to be cut apart and retained by the "referee" as he/she asks questions of team member(s). Teachers will need to provide a die and markers for the yardage and the "football." The game may be extended by devising new questions based on material studied in class.
(Author/JN)

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Energy Football

A GAME CREATED BY STEPHEN L. CANIPE, Ed.D.

DUKE POWER COMPANY
June 1982

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ENERGY FOOTBALL

RULES

The basic rules for this game are the same as for regular football. A coin toss determines who goes first.

- Kick-off- roll a die; multiply the number by 10; this is the distance of the kick-off.
- Run back- roll a die; multiply the number by 5; this is the distance for the run back.
- Plays- there are various difficulty level questions...some for 5 yards, some for 10 yards, some for 15 yards-- to advance, the questions must be answered correctly; if they are incorrectly answered, there is a fumble.
- Fumble- anytime there is an incorrect answer given there is a fumble. If the opposing team can answer the question correctly, then they take over the ball. If the opposition cannot answer the question, then the offensive team maintains possession of the ball and loses only the down. A team member may decline to attempt the answer; in this case, there is a loss of down but no fumble.
- Downs- these are the same as in regular football; there are four downs in which to advance 10 yards.
- Passes- on any down, the offensive team may elect to pass to gain yardage. Before the difficulty of the question is announced, the team must elect to attempt to pass. If the question is then answered successfully, the yardage of the question is multiplied by 3. If the student answers the question incorrectly, there is an interception at the line of scrimmage. If the student declines to attempt an answer, all that is lost is the down, and play continues.
- Punts- whenever the offensive team needs to punt, a die is rolled. The number is multiplied by 4 to see how far the ball travels.
- Punt return- the receiving team rolls a die and multiplies the number showing by 2 to see how far the run back is.

GENERAL NOTES: This game is designed to be played by a minimum of 3 players...a representative from each team and a referee who reads the questions and determines whether the answers are correct. A whole class could play with the answers rotated among the members; again, there needs to be one person who acts as referee.

The game can be played for a specific time or until a specific score is reached.

The questions are taken from the Duke Power booklet...KEOWEE-TOXAWAY... the story of energy.

ANY QUESTION SOURCE CAN BE USED THAT THE STUDENTS CAN STUDY!!!!

TO THE TEACHER:

This game is designed to provide basic energy information to the students. In addition, there are some mathematics that should prove useful in helping to teach addition, subtraction, and multiplication at the same time that the game is being played.

The game cards contain questions, answers, and information on the value of the questions. The cards are to be cut apart and retained by the "referee" as he/she asks the questions of the team member(s).

The teacher will need to provide a die and markers for the yardage and the "football".

Extension of the game is very simple for the teacher who can easily make up new questions based on material studied in class.

Comments and criticisms will be appreciated. Please send them to Steve Canipe, Supervisor of Educational Services, Duke Power, P. O. Box 33189, Charlotte, N. C. 28242.

ENERGY

10

20

30

40

50

40

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ENERGY

5 Yards

What object can an atom be compared to?

solar system

10 Yards

What is in the center of an atom?

protons and neutrons

10 Yards

What orbits outside the nucleus of an atom?

electrons

15 Yards

What determines what chemical element an atom is?

the number of protons in the nucleus

10 Yards

What is another word for fissioning?

splitting

10 Yards

What hits an atom of U-235 causing it to split?

neutron

5 Yards

What controls fission in a nuclear reactor?

control rods

6

5 Yards

How do the control rods work?

by absorbing neutrons

10 Yards

How long does a fuel load last at a nuclear station?

3 years

7

5 Yards

What was the date of the 1st successful light bulb?

1879

5 Yards

Is population growth faster or slower than electricity growth?

slower

10 yards

What type of generating facilities are included in phase I of Keowee-Toxaway?

two hydroelectric, and one nuclear

10 Yards

What is unusual about the Jocassee hydroelectric station?

It is a reversible pumped storage station

10 Yards

What is the reason for man's early fear of energy?

ignorance

10 yards

What is the correct order of the use of energy sources - wood, gas, fire, wind?

fire - wind - wood - gas

10 Yards

What 3 things are needed to produce electricity?

coil of wire, magnet, movement

15 Yards

What is the difference in electricity produced by gas, oil, nuclear, and coal?

none - it is all the same

5 Yards

What provides the energy in a hydroelectric plant?

falling water

5 Yards

What does cooling water have in it when it leaves a thermal electric plant that it did not have when it entered?

heat

5 Yards

A skimmer wall is like a dam in all respects except what?

has large openings at the bottom

15 Yards

When warm water is released from the plant into the lake, where does it accumulate?

surface of lake

15 Yards

Which American industry has the best safety record?

nuclear power industry

15 Yards

How much radiation does a nuclear station release each year?

about 1 millirem per year

15 Yards

What is the average background radiation level?

204 millirems

15 Yards

There are how many separate water loops in the Oconee Station?

Three

5 Yards

What is Duke Power's newest coal-fired station?

Belews Creek

5 Yards

Of what is a nuclear reactor building made?

steel reinforced concrete

10 Yards

What kind of peaking power takes only moments to start and stop and is very economical?

hydroelectric

5 Yards

Pumped storage utilizes how many reservoirs?

two

5 Yards

Pumped storage uses its generator also as a what?

motor

5 Yards

Pumped storage uses its turbine also as a what?

pump

15 Yards

For each 2 kilowatt hours of energy gained through the Jocassee pumped storage, how many must be expended?

3 kwh

10 Yards

Why is the energy loss in pumped storage justified?

on peak electricity is more valuable than off peak energy

5 Yards

Approximately what % of the Piedmont Carolina's electricity comes from coal?

65%

12

10 Yards

In what form is the coal burned in a modern fossil station?

talcum powder fineness

5 Yards

If you were to describe the size of an atom, what words would you use?

very small, minute, tiny, mini-scale

13

5 Yards

What type of energy is converted to produce steam in a coal fired plant?

chemical energy

5 Yards

What is the one major difference in a coal fired and a nuclear powered station?

the fuels

5 Yards

What was among the earliest devices used by the pioneers to harness energy?

waterwheel

10 Yards

What energy source powered the nation's first textile mills?

waterwheels

5 Yards

What was Duke Power's earliest means of generating electricity?

falling water - waterwheels

5 Yards

What percentage of the total electric load does hydro-electricity carry today?

40 - 50%

10 yards

Most hydroelectric power is not used continuously but what type of power does it provide?

peaking power

5 Yards

During what period of the 24 hour day is electricity demand lowest?

late night

5 Yards

How long does the peak period last?

several hours